

## Computer Program Listing Appendix A

### 1 Text string resources used for expert system:

#### 2 Project/Fabric Strings:

3 IDS\_PROJECT "No Project type selected."  
4 IDS\_COTTON "Ordinary cotton, polyester, or blends embroider easily."  
5 IDS\_COTTON/POLYESTER "Ordinary cotton, polyester, or blends embroider easily. If you are working with a heavy weight, also  
6 check out the instruction for Canvas/Denim. Since this category covers a broad range of fabrics, let's just add that you don't want to stretch  
7 the fabric itself. this will cause compensation problems; your colors may not register well. Always try to get the fabric stable before hooping  
8 it to eliminate this problem. When hooping, remember to make sure the fabric is 'drum tight'."  
9 IDS\_CANVAS/DENIM "Canvas and denim are generally easy to embroider and don't require a lot of stabilizer."  
10 IDS\_FLEECE "Fleece is wonderful to embroider."  
11 IDS\_HATS "Hats that are structured have stabilizer built-in. You may not have to use much stabilizer. The trouble is hooping; the hat  
12 won't press into the frame easily. Alignment takes practice."  
13 IDS\_HATU "Hats that are not structured require a little extra stabilization. They are less difficult to embroider than structured hats, but  
14 can still be difficult."  
15 IDS\_HOSIERY "Hosiery, stockings, etc., can be embroidered! This project is unusual because we actually stretch the material for a change!  
16 Be very careful not to get other parts of the stocking caught! (It will probably happen the first time you try this type of  
17 embroidery.)"  
18 IDS\_JERSEY "Sweatshirt or jersey material can be difficult because of its tendency to shrink under the tension of embroidery. Due to  
19 this, stabilization is very important. Do not attempt to pull the fabric tight in the hoop as this makes the problem very bad.  
20 Just make sure that the stabilizer is hooped tightly, with the fabric adhered to it in a 'relaxed' state."  
21 IDS\_LACE "Using lace designs is easy if you use a net or tulle as a foundation and some water-soluble stabilizer adhered well to it. You  
22 may want to use self-adhesive water-soluble stabilizer. If you do, hoop the stabilizer, expose some of the sticky area, and  
23 press the net onto it."  
24 IDS\_LEATHER "Leather is fairly stable, but will stretch as you hoop it, therefore use an iron-on stabilizer. Split leather (garment-weight)  
25 will fit into your hoop. Some leathers, however, are too heavy."  
26 IDS\_LINEN "Linen sews out like most cotton or polyester fabrics, however it typically is a loose weave, so be careful not to stretch the  
27 fabric, particularly on the bias."  
28 IDS\_LYCRA "Lycra and other 'super-stretch' fabrics can be surprisingly easy. The difficulty lies in approximating the amount of stretch  
29 the fabric will endure, because that's the amount of stretch that gets applied during the hooping process."  
30 IDS\_METAL "Metal work or copper-punch is neat if you have a design digitized for it. Remember that every 'stitch' will leave a hole  
31 when you are digitizing for this process. Since it is unlikely that your metal plate will be hoop-able, put some self-adhesive  
32 stabilizer in the hoop and expose just enough stickiness to be sure that your metal won't shift. When you're done, release the  
33 stabilizer from the hoop and have some solvent on hand to remove the adhesive that's left behind. If you do this carefully,  
34 you'll have no bends in your metal!"  
35 IDS\_MICROTEX "We've been seeing these high-density fabrics recently, and they have their uses, but you must first remember that they have  
36 needle problems: Use a sharp (microtex) needle. In a pinch, a leather or denim needle will do."  
37 IDS\_QUILTED "Quilted material is easy to embroider because in a sense it is already stable. One thing is important though; use a tear-away  
38 stabilizer on the back so that the texture of the back won't snag as it embroiders."  
39 IDS\_SATIN "Satin sews easily and is easily stabilized. The real difficulty is hooping this fabric (it can be very slippery). If your satin is  
40 made of acetate, remember that water will leave spots, so we don't advise water-soluble stabilizer, and check your iron/press  
41 before pressing."  
42 IDS\_PIQUE "The typical sports shirt is made of a very breathable fabric known as a pique knit. This fabric also moves easily over the  
43 body. What this also means is that it will pull-in after embroidering if you're not careful! Although it is not likely to stretch  
44 much, pique knit wants to be treated as if it would. Relax the fabric as much as possible before stabilizing. You may also  
45 want to lower your tension slightly (Only slightly). If you have a bunch of shirts to do, practice on a sample first. "  
46 IDS\_SILK "Silk is wonderful to embroider, but use a sharp (microtex) needle. Be careful not to stretch on the bias when tightening the  
47 hoop."

## Computer Program Listing Appendix A

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48 IDS_BATH "Bath towels are very heavy, the result of which is that designs may lose some detail. However, towels are fairly easy to
49 embroider. You can even make a two-sided towel by matching your bobbin thread. Hoop a heavy water-soluble, then use
50 spray-adhesive to attach the towel to the stabilizer. "
51 IDS_HAND "Hand towels are less heavy than bath towel, and the odds are that you can hoop it."
52 IDS_VELVET "Velvet can be difficult, but yields wonderful results! Test to see if hooping your velvet will crush it. Also test for water-
53 marks, if you're inclined to use a water-soluble stabilizer on top to stabilize the nap of the fabric. "
54 IDS_VINYL "Vinyl can be embroidered, but the catch is to use a good stabilizer underneath. The reason is that vinyl can be literally
55 cut-out if the density of the stitches is high. By using a good cut-away, or perhaps even another layer of fabric, you will
56 actually be sewing the vinyl onto the underlaying material, which helps a lot. Use a leather needle (jeans needle in a pinch)
57 to keep the holes as small as possible."
58 IDS_WOOL "Wool is wonderful to embroider, but be careful if it has a pile or a stretch. Wools today are blended with many other
59 fabrics, so this will require some attention."
60 General Purpose String resources:
61 IDS_NEEDLEINFO "\r\n\r\nThe following are my needle recommendations:\r\n"
62 IDS_HOOPINFO "\r\n\r\nThe following are my hooping recommendations:\r\n"
63 IDS_STABILIZERINFO "\r\n\r\nThe following are my stabilizer recommendations:\r\n"
64 IDS_STANDARD "No stock answer"
65 Hooping resources:
66 IDS_NOHOOP "Tightly hoop a self-adhesive tear-away stabilizer without removing the lining paper. Use a sharp knife or seam ripper to
67 score a large section of the lining paper and peel it away, exposing the sticky surface. Carefully press your fabric into
68 position. The more times you have to try to re-align it, the less sticky stuff you'll have "
69 IDS_NOHOOPSOLVY "Add a layer of water-soluble stabilizer to the top of the fabric. You may want to use a little spray adhesive to hold it in
70 place."
71 IDS_NOHOOPBASTE "With your design stabilized, embroider a basting stitch to help further anchor the stabilizer and fabric together. To create a
72 basting stitch, use the 'Auto Baste' feature in Designer's Gallery."
73 Stabilization resources:
74 IDS_NOWATER "Be careful using water-soluble stabilizer on this fabric. Test thoroughly!"
75 IDS_NOHEAT "If you use a stabilizer that dissolves with heat, be careful. If there is any nylon in your fabric, you must keep the heat low."
76 IDS_NORMAL "Use a self-adhesive tear away stabilizer, cut big enough to fit the hoop."
77 IDS_IRONON "Or, better yet, use an iron-on stabilizer."
78 IDS_CUTAWAY "Or, better still, use a cut-away stabilizer."
79 IDS_TEARAWAY "Or, better still, use a tear-away stabilizer."
80 IDS_HEAVYSOLVY "Also add a layer of heavy water-soluble stabilizer to the top (Some of these are now available as self-adhesive
81 too!)"
82 IDS_CLEARMELT "A handy alternative to water-soluble stabilizers are those that 'melt' away with heat."
83 IDS_MODSTRETCH "Since you have increased the stretch setting, it is probable that you want to use a better-adhered stabilizer. Also, remember
84 to tighten the stabilizer, not the fabric, in the hoop."
85 Other String Resources:
86 IDS_RETURN "\r\n"
87 IDS_MODSTRETCHNONE "Hypothetical question: How does that exist without stretch?"
88 IDS_MODSTRETCHMETAL "By the way, how does metal have stretch?"
89 Needle and Thread String resources:
90 NDL_LEATHER "Needle: Leather, size 14"
91 NDL_JEANS "Needle: Jeans, size 14"
92 NDL_EMBROIDERY "Needle: Embroidery, size 14"
93 NDL_EMBROIDERY "Needle: Embroidery, size 11-12"
94 NDL_EMBSMALL "Needle: Embroidery, size 11"
95 NDL_STRETCH "Needle: Stretch, size 12"
96 NDL_UNIBIG "Needle: Universal, size 18"

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## Computer Program Listing Appendix A

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97     NDL_MICROTEX    "Needle: Microtex, size 11-12"
98     IDS_40WT        "Thread: 40wt."
99     IDS_35WT        "Thread: 35wt."
100    IDS_30WT        "Thread: 30wt."
101    IDS_50WT        "Thread: 50wt."
102    IDS_NOTHREAD    "No Thread"
103    Project String table indexes
104    IDS_SETTING      "No setting"
105    IDS_SCOTTON      "000"
106    IDS_SCANVAS      "340"
107    IDS_SFLEECE      "311"
108    IDS_SHATS        "340"
109    IDS_SHAT         "300"
110    IDS_SHOSIERY     "222"
111    IDS_SJERSEY      "011"
112    IDS_SLACE        "221"
113    IDS_SLEATHER     "351"
114    IDS_SLINEN       "110"
115    IDS_SLYCRA       "142"
116    IDS_SMETAL       "450"
117    IDS_SMICROTEX    "150"
118    IDS_SQUILTED     "400"
119    IDS_SSATIN       "100"
120    IDS_SPIQUE       "111"
121    IDS_SSILK        "140"
122    IDS_SBATH        "440"
123    IDS_SHAND        "340"
124    IDS_SVELVET      "341"
125    IDS_SVINYL       "450"
126    IDS_SWOOL        "340"
127    void CStabAdvDlg::Recommend()
128    { // Start with a clean slate:
129        rec = "";
130        recList.RemoveAll();
131        // Display info on project.
132    Sample Code Functions for Analysis Software
133        recList.AddTail(RecList(IDS_COTTON + m_project));
134        // Create the MustBePriorTo list.
135        // Create the MustFollow list.
136        // Add the needle and thread recommendations
137        if(IsInList(IDS_COTTON)) { m_needle.LoadString(NDL_EMBROIDERY);    m_thread.LoadString(IDS_40WT); }
138        if(IsInList(IDS_CANVAS)) { m_needle.LoadString(NDL_JEANS);        m_thread.LoadString(IDS_35WT); }
139        if(IsInList(IDS_FLEECE)) { m_needle.LoadString(NDL_EMBROIDERY);    m_thread.LoadString(IDS_30WT); }
140        if(IsInList(IDS_HATS)) { m_needle.LoadString(NDL_EMBROIDERY);    m_thread.LoadString(IDS_40WT); }
141        if(IsInList(IDS_HATU)) { m_needle.LoadString(NDL_EMBROIDERY);    m_thread.LoadString(IDS_40WT); }
142        if(IsInList(IDS_HOSIERY)) { m_needle.LoadString(NDL_EMBSMALL);    m_thread.LoadString(IDS_40WT); }
143        if(IsInList(IDS_JERSEY)) { m_needle.LoadString(NDL_STRETCH);    m_thread.LoadString(IDS_40WT); }
144        if(IsInList(IDS_LACE)) { m_needle.LoadString(NDL_EMBROIDERY);    m_thread.LoadString(IDS_35WT); }
145        if(IsInList(IDS_LEATHER)) { m_needle.LoadString(NDL_LEATHER);    m_thread.LoadString(IDS_30WT); }

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## Computer Program Listing Appendix A

```

146  if(IsInList(IDS_LINEN)) { m_needle.LoadString(NDL_EMBROIDERY);          m_thread.LoadString(IDS_40WT); }
147  if(IsInList(IDS_LYCRA)) { m_needle.LoadString(NDL_EMBROIDERY);          m_thread.LoadString(IDS_40WT); }
148  if(IsInList(IDS_METAL)) { m_needle.LoadString(NDL_UNIBIG);              m_thread.LoadString(IDS_NOTHREAD); }
149  if(IsInList(IDS_MICROTEX)) { m_needle.LoadString(NDL_MICROTEX);          m_thread.LoadString(IDS_50WT); }
150  if(IsInList(IDS_QUILTED)) { m_needle.LoadString(NDL_EMBROIDERY);          m_thread.LoadString(IDS_40WT); }
151  if(IsInList(IDS_SATIN)) { m_needle.LoadString(NDL_MICROTEX);            m_thread.LoadString(IDS_40WT); }
152  if(IsInList(IDS_PIQUE)) { m_needle.LoadString(NDL_EMBROIDERY);          m_thread.LoadString(IDS_40WT); }
153  if(IsInList(IDS_SILK)) { m_needle.LoadString(NDL_MICROTEX);            m_thread.LoadString(IDS_50WT); }
154  if(IsInList(IDS_BATH)) { m_needle.LoadString(NDL_JEANS);                m_thread.LoadString(IDS_30WT); }
155  if(IsInList(IDS_HAND)) { m_needle.LoadString(NDL_EMBROIDERY);          m_thread.LoadString(IDS_35WT); }
156  if(IsInList(IDS_VELVET)) { m_needle.LoadString(NDL_EMBROIDERY);          m_thread.LoadString(IDS_40WT); }
157  if(IsInList(IDS_VINYL)) { m_needle.LoadString(NDL_LEATHER);            m_thread.LoadString(IDS_30WT); }
158  if(IsInList(IDS_WOOL)) { m_needle.LoadString(NDL_EMBROIDERY);          m_thread.LoadString(IDS_35WT); }
159  // Create the stabilizer advise
160  if(!recList.IsEmpty())
161  {
162      //recList.AddTail(RecList(IDS_STABILIZERINFO));
163      if(IsInList(IDS_COTTON)) recList.AddTail(RecList(IDS_NORMAL));
164      if(IsInList(IDS_COTTON/POLYESTER)) recList.AddTail(RecList(IDS_NORMAL));
165      if(IsInList(IDS_CANVAS)) recList.AddTail(RecList(IDS_NORMAL));
166      if(IsInList(IDS_FLEECE)) recList.AddTail(RecList(IDS_NORMAL));
167      if(IsInList(IDS_HATS)) recList.AddTail(RecList(IDS_NOHOOP));
168      if(IsInList(IDS_HATU)) recList.AddTail(RecList(IDS_NOHOOP));
169      if(IsInList(IDS_HOSIERY)) recList.AddTail(RecList(IDS_NOHOOP));
170      if(IsInList(IDS_JERSEY))
171      {
172          recList.AddTail(RecList(IDS_NORMAL));
173          recList.AddTail(RecList(IDS_CUTAWAY));
174      }
175      //if(IsInList(IDS_LACE)) recList.AddTail(RecList(IDS_NORMAL));
176      if(IsInList(IDS_LEATHER)) recList.AddTail(RecList(IDS_NOHOOP));
177      if(IsInList(IDS_LINEN))
178      {
179          recList.AddTail(RecList(IDS_NORMAL));
180          recList.AddTail(RecList(IDS_IRONON));
181      }
182      if(IsInList(IDS_LYCRA))
183      {
184          recList.AddTail(RecList(IDS_NORMAL));
185          recList.AddTail(RecList(IDS_NOHOOPBASTE));
186          recList.AddTail(RecList(IDS_NOHEAT));
187      }
188      //if(IsInList(IDS_METAL)) recList.AddTail(RecList(IDS_NORMAL));
189      if(IsInList(IDS_MICROTEX)) recList.AddTail(RecList(IDS_NORMAL));
190      if(IsInList(IDS_QUILTED)) recList.AddTail(RecList(IDS_NORMAL));
191      if(IsInList(IDS_SATIN))
192      {
193          recList.AddTail(RecList(IDS_CLEARMELT));
194          recList.AddTail(RecList(IDS_NORMAL));
195          recList.AddTail(RecList(IDS_IRONON));
196      }
197      if(IsInList(IDS_PIQUE))
198      {
199          recList.AddTail(RecList(IDS_NORMAL));
200          recList.AddTail(RecList(IDS_CUTAWAY));
201          recList.AddTail(RecList(IDS_HEAVYSOLVY));
202          recList.AddTail(RecList(IDS_NOHOOPBASTE));
203      }
204      if(IsInList(IDS_SILK)) recList.AddTail(RecList(IDS_NORMAL));
205      if(IsInList(IDS_BATH))

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## Computer Program Listing Appendix A

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195         {   recList.AddTail(RecList(IDS_NOHOOPSOLVY));
196             recList.AddTail(RecList(IDS_NOHOOPBASTE));   }
197     if(IsInList(IDS_HAND))
198     {   recList.AddTail(RecList(IDS_NORMAL));
199         recList.AddTail(RecList(IDS_NOHOOPSOLVY));
200         recList.AddTail(RecList(IDS_NOHOOPBASTE));   }
201     if(IsInList(IDS_VELVET))
202     {   recList.AddTail(RecList(IDS_CLEARMELT));
203         recList.AddTail(RecList(IDS_NOHEAT));
204         recList.AddTail(RecList(IDS_NORMAL));   }
205     //if(IsInList(IDS_VINYL)) recList.AddTail(RecList(IDS_NORMAL));
206     if(IsInList(IDS_WOOL))
207     {   recList.AddTail(RecList(IDS_NORMAL));
208         recList.AddTail(RecList(IDS_NOHOOPSOLVY));   }
209     }   // if(!recList.IsEmpty())
210     // Create the stabilizer MustBePriorTo list.
211     // Create the stabilizer MustFollow list.
212 Sample Code Function for Operator Parameter Selection
213     // Use rules to modify based on users changing settings.
214     if(!IsInList(IDS_METAL) && (tStretch < m_stretch)) // Stretch increased
215     {
216         recList.AddTail(RecList(IDS_RETURN));
217         recList.AddTail(RecList(IDS_RETURN));
218         recList.AddTail(RecList(IDS_MODSTRETCH));
219     }
220     if(IsInList(IDS_COTTON))
221     {   if(m_thickness > 2) m_needle.LoadString(NDL_JEANS); }
222     if(IsInList(IDS_COTTON/POLYESTER))
223     {   if(m_thickness > 2) m_needle.LoadString(NDL_JEANS);   }
224     if(IsInList(IDS_CANVAS))
225     {   if(m_thickness < 3) m_needle.LoadString(NDL_EMBROIDERY);   }
226     if(IsInList(IDS_FLEECE))
227     { }
228     if(IsInList(IDS_HATS))
229     { }
230     if(IsInList(IDS_HATU))
231     { }
232     if(IsInList(IDS_HOSIERY))
233     {   if(!m_stretch)
234         {   recList.AddTail(RecList(IDS_RETURN));
235             recList.AddTail(RecList(IDS_RETURN));
236             recList.AddTail(RecList(IDS_MODSTRETCHNONE)),
237         }
238     }
239     if(IsInList(IDS_JERSEY))
240     { }
241     if(IsInList(IDS_LACE))
242     { }
243     if(IsInList(IDS_LEATHER))
244     { }

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**Computer Program Listing Appendix A**

```
244 if(IsInList(IDS_LINEN))
245 { }
246 if(IsInList(IDS_LYCRA))
247 {
248     if(!m_stretch)
249     {
250         recList.AddTail(RecList(IDS_RETURN));
251         recList.AddTail(RecList(IDS_RETURN));
252         recList.AddTail(RecList(IDS_MODSTRETCHNONE)),
253     }
254 }
255 if(IsInList(IDS_METAL))
256 {
257     if(m_stretch)
258     {
259         recList.AddTail(RecList(IDS_RETURN));
260         recList.AddTail(RecList(IDS_RETURN));
261         recList.AddTail(RecList(IDS_MODSTRETCHMETAL));
262     }
263 }
264 if(IsInList(IDS_MICROTEX))
265 { }
266 if(IsInList(IDS_QUILTED))
267 { }
268 if(IsInList(IDS_SATIN))
269 { }
270 if(IsInList(IDS_PIQUE))
271 { }
272 if(IsInList(IDS_SILK))
273 { }
274 if(IsInList(IDS_BATH))
275 { }
276 if(IsInList(IDS_HAND))
277 { }
278 if(IsInList(IDS_VELVET))
279 { }
280 if(IsInList(IDS_VINYL))
281 { }
282 if(IsInList(IDS_WOOL))
283 { }
284 // Establish thread
285 CString temp;
286 float thread = 4;
287 temp.LoadString(IDS_35WT);
288 if(m_thread == temp) thread = 3.5;
289 temp.LoadString(IDS_30WT);
290 if(m_thread == temp) thread = 3;
291 temp.LoadString(IDS_50WT);
292 if(m_thread == temp) thread = 5;
293 display.thread = thread;
294 // Now analyze the density
295 CString analysis;
296 BEmbroideryFile ft;
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## Computer Program Listing Appendix A

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293 ft = display.file;
294 int w = (int)((float)abs(ft.maxX - ft.minX)) * thread/11);
295 w = ((w + 1) / 2) * 2; // DWORD align width for storage.
296 int h = (int)((float)abs(ft.maxY - ft.minY)) * thread/11);
297 ft.width = w;
298 ft.height = h;
299 ft.RenderDensityBitmap();
300 ft.AnalyzeDensity();
301 POSITION pos = ft.densityColorList.GetHeadPosition();
302 CString a = "I have analyzed the density of your design.\r\n", b;
303 int count = 1;
304 float pct = 0;
305 while(pos)
306 {
307     BEmbroideryColor col = ft.densityColorList.GetNext(pos);
308     if(ft.densityMapSum)
309         pct = ((float)col.stitches) / ((float)ft.densityMapSum);
310     b.Format("Density: %i : %6.2f\r\n", count, pct*100);
311     a += b;
312     count++;
313 }
314 analysis = a;
315 rec = analysis;
316 rec += "\r\n\r\n";
317 // Place the recommendation in the box.
318 pos = recList.GetHeadPosition();
319 while(pos)
320 {
321     RecList r = recList.GetNext(pos);
322     rec += r.string;
323     if(pos && (" \n" != rec.Right(1))) rec += " ";
324 }
325 m_edit = rec;
326 UpdateData(false);
327 // Reset the display
328 display.Invalidate( );
329 }
330 END

```